

Can Mobile Phones Be Used To Improve The Quality Of Learning In Open Schooling?

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Theme: Formal education, and

Sub- Theme : Open Schooling

ABSTRACT

Mobile phones have become ubiquitous. Almost anyone who can have a mobile phone has one. The amount of information and access to it has grown exponentially, thereby the potential for using varied resources for instruction and learning have increased. In this context, can mobile phones be used as an engaging tool for learning? If educational technology theory, research, and pedagogy are re-conceptualized to include the tools and knowledge that students already possess, then will students using mobile phones have better opportunities to connect learning inside and outside the school? These questions prompted in an exploratory study which was made with learners of Open Schooling in India to find out their access to mobile phones, the pattern of their current mobile phone usage and their perception on use of mobile phones for educational purpose. This paper presents the results of this study and provides a snapshot of the current status which can serve as a foundation to further planning for the implementation of ICT-related activities in Open schooling.

1.0 INTRODUCTION

Among all the ICT tools available today, mobile phones has been the most popular and widespread personal technology rapidly adopted all over. According to International Telecommunication Union (ITU), by the end of 2009 there is an estimated 4.6 billion subscriptions globally. The whole world is going mobile and we are witnessing the emergence of a connected, mobile society, with a variety of information sources and means of communication available at home, work, school and in the community at large. Undoubtedly this has created interest in educators and technical developers in exploiting the unique capabilities and characteristics of mobile technologies, in particular the mobile phones, to enable new and engaging forms of learning. Sharples (2003) suggests that rather than seeing mobile phones as disruptive devices, educators should seek to exploit the potential of the technologies learners bring with them and find ways to put them into good use for the benefit of learning practice. Learners are already inventing ways to use their phones to learn what they want to know. It is hence important for educators to figure out how to deliver educational product in a way that fits into our students' digital lives and their mobile phones.

Many studies (Attewell, 2005; Chen & Kinshuk, 2005; Murat, S et al, 2008) have already shown that mobile technologies have considerable potential to enhance teaching and learning across all education sectors. Their impact on student behaviour, enthusiasm, motivation and progress is well documented (Rau et al. 2008), especially in some conventional schools in the UK (Cook et al. 2007).

The current trend in mobile phone penetration makes it virtually certain that not too far in the future all of the world's student community will possess a mobile phone. Moreover the feature of being able to connect any time anywhere makes the mobile phone to be a viable and feasible personal technology for distance learners. This is a sufficient reason and motivation to explore the possibility of making the mobile phone an important tool in the educational systems of developed and developing countries. If educational technology theory, research, and pedagogy are re-conceptualized to include the tools and knowledge that students already possess, then it is imperative to have a clear understanding not only of the technology but also of the students who are using or would use mobile phones in their daily life.

Open schools have so far provided less evidence of formal use of mobile phones and this provides the context for undergoing an exploratory study on the learners of Open Schooling in India to find out their access to mobile phones, the pattern of their current mobile phone usage and their perception on use of mobile phones for educational purpose.

2.0 MOBILE PHONE: THE COUNTRY SITUATION

With changed Government policy on liberalization for country's growth and development, India has seen phenomenal growth in the Telecom sector which typically considers telephone and computers. It is seen that over the last three years, the Telecom sector has grown remarkably in the range of 29% – 47%. Like any other parts of the world, the principal driver for Telecom growth in the country was the growth in mobile phones.

According to Telecom Regulatory Authority of India (TRAI), as on March 3, 2010, the Total Telephone subscriber base reached 621.28 Million in which

- Wireless subscription base increased from 563.73 Million in February-2010 to 584.32 Million at the end of March-2010, and
- Wireline subscriptions remained the same at 36.96 Million.

In other words in this period there was 20.31 Million new additions in wireless registering a growth of 3.60%. However the overall Tele-density in India reached 52.74 and Wireless Tele-density stands at 47.91 (http://www.trai.gov.in/pressreleases_list_year.asp). Compared to this the broadband subscription in this period was just 8.75 million.

Fig: 1 shows the growth trend for Wireless subscriber base in India.

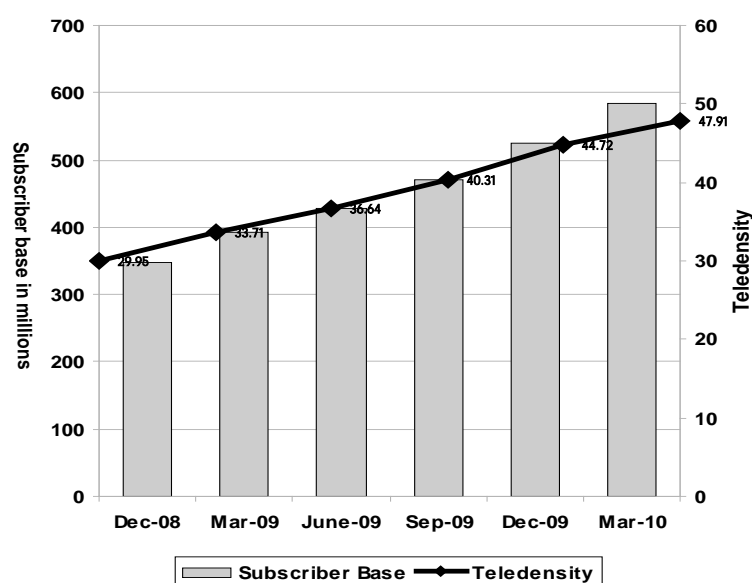


Fig 1: Wireless Subscriber Base and Tele-density

(Source: TRAI)

In India, 72% of the population lives in rural areas. As stated by TRAI, in the document 'The Indian Telecom Services Performance Indicators (2009)', rural subscription showed an increase in rate of growth, from 12.5% in Sep-09 to 16.2% in Dec-09. Urban subscription grew at the rate of 9.2% as against 9.5% in the previous quarter. The share of rural wireless subscription increased to 31.3% in total wireless subscription as shown in Fig 2.

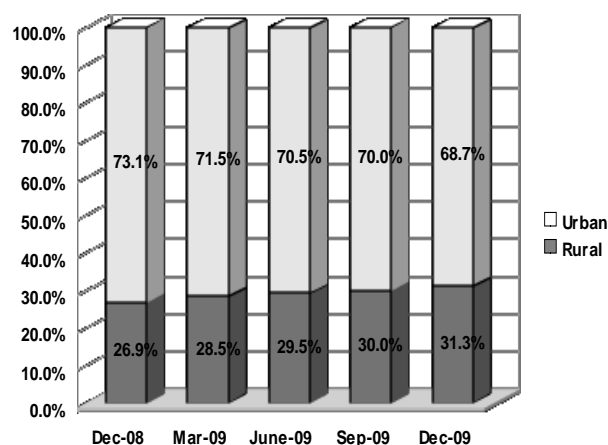


Fig2: Wireless Market Share – Rural & Urban

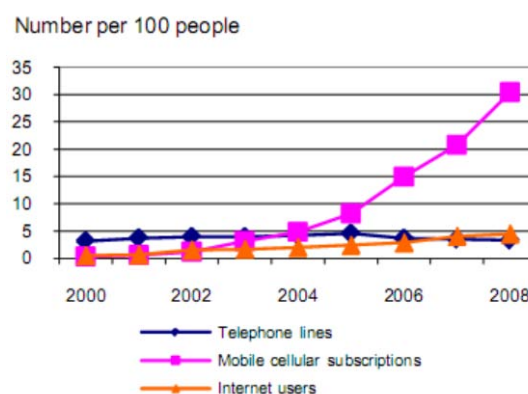
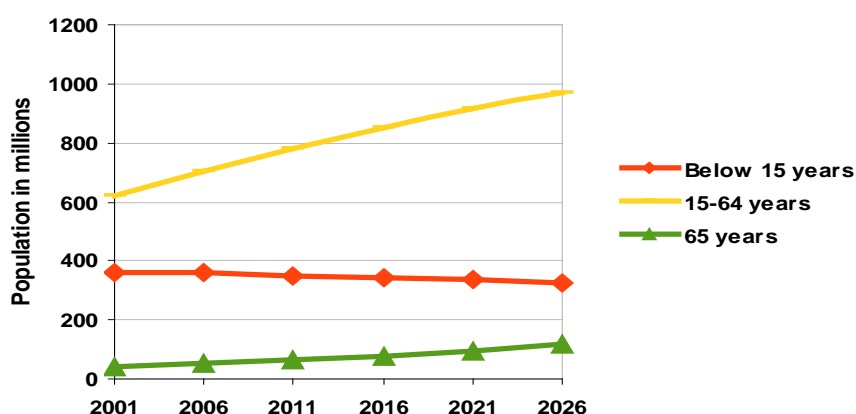


Fig 3: Access to ICT in India

This shows that the dominance of wireless segment in access services is not only steadily growing but also reaching out to the rural community faster than any other communication technology. This is substantiated by the World Bank data - ICT at a Glance, in Fig 3. It shows that a mobile cellular subscription per 100 people is 30.4 while a personal computer per 100 people is 3.3 and an Internet user per 100 people is 4.5 (<http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTIC/0,,contentMDK:20459133~menuPK:64909262~pagePK:64909151~piPK:64909148~theSitePK:6950074~isCURL:Y~isCURL:Y,00.html#>)

In India 31.1% and 63.6% of the population are in the age range 0-14years and 15-65years respectively i.e. more than 90% of the population are in the age range from 0-64 years and a considerable number is young. An estimate of 40 % of total population is youths (in the age range 15-24years representing a subset of adult population). Fig: 4 show the youth population projection and in this youth segment majority is expected to belong to student community.



Data source: <http://youthportal.gov.in/statistics/YouthPopulationProjectionsinmillions.htm>

Fig 4: Youth Population Projections

3.0 OPEN SCHOOLING: LEARNERS AND LEARNING

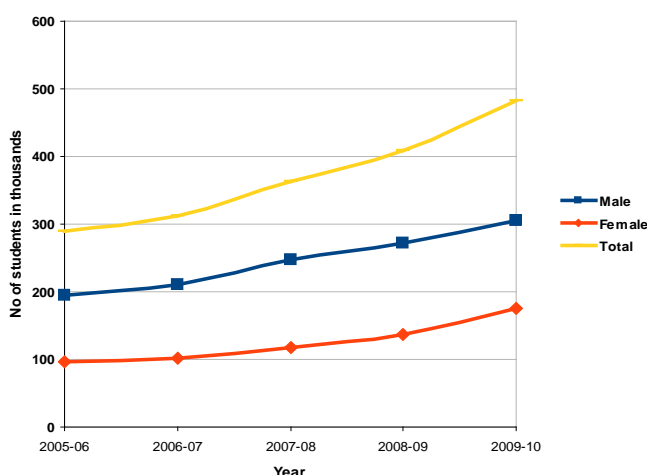


Fig 5: Enrolment Trend in NIOS

The Government of India established the National Institute of Open schooling (NIOS) to provide need based educational opportunities to those who cannot and do not go to formal schools. Since 1991, the total number of learners who have earned certificates at secondary and senior secondary levels and vocational courses is 17, 56,399.

Every year the enrolment has been growing steadily. Fig 5 shows the enrolment trend for the last five years.

Typically the age structure of these learners is as illustrated in Fig 6.

It is seen that majority are in the age range 14-20years and 91% are in the age range 14-25years which is in conformity with Fig 4 to say that the learners are mostly youths and young adults.

Looking into the issue of access, currently like any other open schools, NIOS, have adopted distance learning methodologies that can be ensured for all enrolled students. Self-learning printed materials continue to be the prime mode of instruction supported by face to face

contact sessions, audio and video programmes. Radio and TV broadcast are also utilised to support learning. E-learning strategies are not used completely for any course delivery.

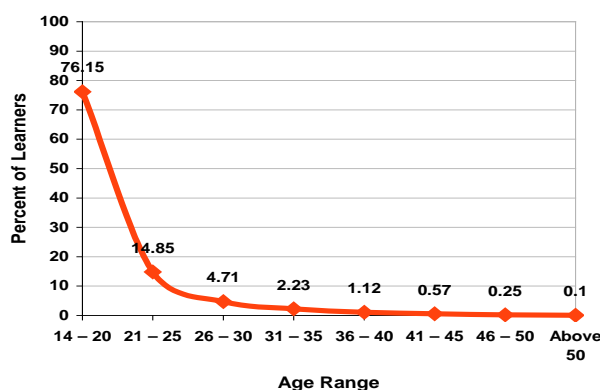


Fig 6: Age Structure of the NIOS learners

It can be said that ICT is mostly used for management of student information, dissemination of information, handling query, administrative functions and for admission and evaluation purposes. Although efforts are on to utilise ICT for delivery of content, it must be kept in mind that in India as opposed to 3.3 personal computers per 100 people, mobile cellular subscriptions per 100 people is 30.4. Many teenagers and youths who are students with NIOS would already own and carry mobiles. Therefore it is worthwhile to explore the viability of using this mobile phone technology for educational and developmental purpose.

4.0 THE STUDY

4.1 Sample

Looking into the countrywide distribution of NIOS learners and the paucity of time and resources, a convenient sampling was considered in which it was decided that data would be collected from those learners who were easily contactable. It was decided that NIOS learners who visit the NIOS Headquarters to avail the facility of On Demand Examination System (ODES) twice a week would be contacted. This group would be from and around National Capital Region (NCR) region. Another place where the learners would be contactable is their study centres where they visit for face to face Personal Contact Programmes (PCPs). A study centre from Kolkata region where PCPs were scheduled was considered for this with a view to have an idea about learners from a place other than in and around Delhi. In all 152 learners were contactable, 94 being from NCR and 58 from Kolkata.

The study is to be considered as an exploratory one within the qualitative and interpretative domains. Limitations to this approach need to be acknowledged.

4.2 Tool

A questionnaire was developed comprising of following three sections:

- Section 1 provided data for the characteristics of the learners and was intended for all
- Section 2 refers to data related to mobile phone for those who own a mobile phone;
- Section 3 is for those who do not yet own a mobile phone.

The questionnaire was designed by combining some established question patterns from a previous survey study by Market Analysis Consumer Research Organisation (MACRO) with new items on the perception of learners on using mobile phone for educational purpose to make the study contextual and relevant.

This was administered in the NCR region to learners who came to the NIOS Headquarters for ODES on two consecutive days. In Kolkata it was administered in a study centre where learners had come to attend PCPs.

5.0 RESULTS AND DISCUSSION

While it is desirable that all questions included in a data collection instrument be answered by all intended respondents, a certain percentage of non-response (NR) is inevitable. In this case also some learners did not complete some questions within the questionnaire and hence the percentage of learners for whom no response was available for a given question is reported directly. It appears that for some questions no response meant not willing to share or maybe incomprehensible to give a response as the questionnaire was in English and English is not the medium of instruction for all. This is a limitation of the study.

5.1 Sample Profile:

Table: 1 illustrates the profile of the sample learners and mobile phone ownership. It is seen that more than 80% of the sample learners in the two regions have access to mobile phones-- - 79.79% of learners in NCR while 82.76 % in Kolkata.

Table 1: Profile of Sample Learners:

Sample	Gender (%)		Average Age (years)	Access to Mobile phones (%)
	Male	Female		
NCR (N=94)	71.28	28.32	17	79.79
Cal (N=58)	65.52	34.48	18	82.76
Total (N=152)	69.08	30.92	17.57	80.92

Since majority of the student population in NIOS is in the age range 14-20years, the average age in the sample is within this range. The male and female percent of learners in the sample is in accordance to the percent in the total population in NIOS.

Although for most learners, parents are educated up to some particular level from primary to post graduate (Fig 7), 7.24% learners reported that their father had 'no education' while 16.45% learners reported that their mother had 'no education'. However, only 3.29% of the total sample learners came from a family where both parents were not educated while 50% of learners who responded to this item came from a family where the father and the mother are educated beyond Graduation and above.

As illustrated in Fig: 8 for 43.42% of learners, the Monthly Income (MI) is between Rs5000-Rs10000. i.e. the learners belong to Lower Income Group (LIG). Almost equal percent of learners come from Lower Middle Income (with MI=Rs10000-Rs15000) or Middle Income (MI=Rs15000-Rs20000) family.

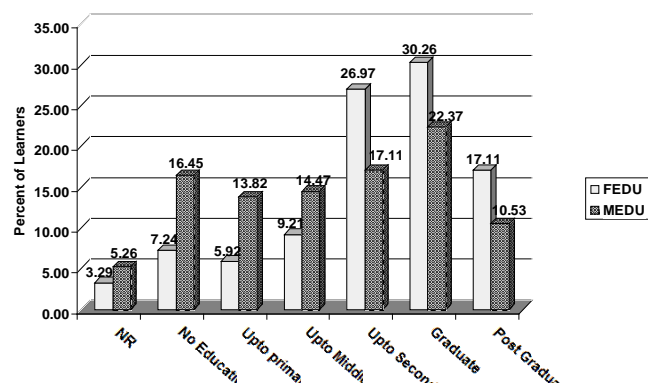


Fig 7: Parents Education

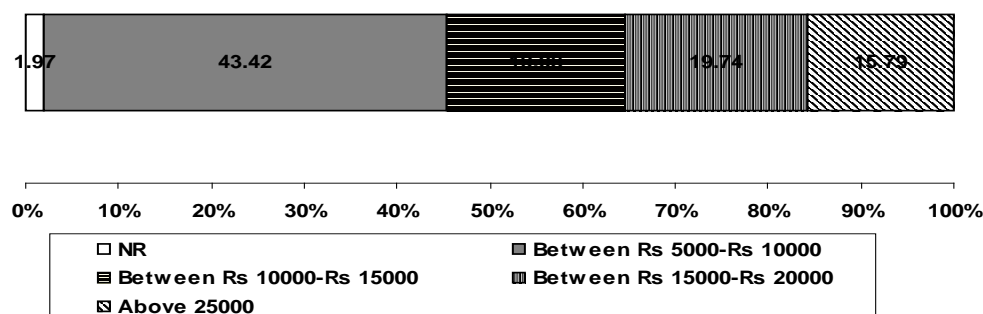


Fig 8: Monthly Income

Samrajiva & Zainudeen (2008) found in their study that mobile phone ownership is increasingly more common in the lower socioeconomic segments of society (http://www.idrc.ca/openbooks/378-2/#page_39). Also widespread availability of low cost handsets,

and low recurring costs typically driven by competition, increased the affordability in middle-income states or rural India.

Thus, although the economic status of the learners varies, 80% of them seem to have access to a mobile phone.

5.2 Learners with NO ACCESS to Mobile Phones

The reasons for 20 % of learners in the sample who had no access to a mobile phone are illustrated in Fig: 9. 42% of these learners did not feel the need and cost was a factor for only 10% of these learners.

However, most learners (68.97%) stated that they do have plans to buy a mobile phone in near future. About 44.3% stated they would purchase one when they start working /earning or when they start to go to senior college. Very few (10.34%) stated that within the next month or so they would purchase one.

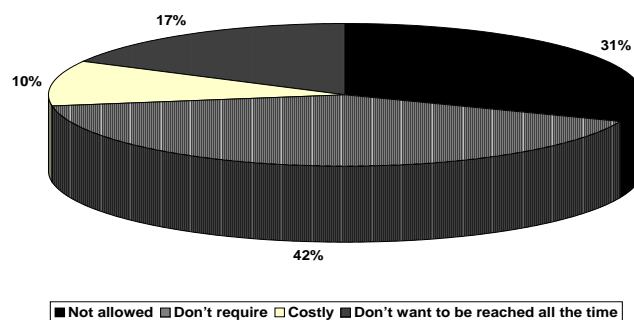


Fig: 9 Reasons for no access to a mobile phone

Interestingly it is seen that the strongest factor based on which these learners would purchase a mobile is not the "Price" factor.....instead it is the "look and feel" factor followed by price, then battery power and then Mobile based services. This is in conformity to what Walsh and White (2006) states that some social commentators (e.g., Carroll, Howard, Peck, & Murphy, 2002; Ozcan & Kocak, 2003) have noticed that young people display their phone in public, particularly if it is a new

model, possibly to improve their status amongst peers. Although 21% did not respond to the model that they would prefer to buy, Nokia handset also seems to be the choice for 65.5% of this group. It appears that these 65.5% were aware of modern mobile phones having the possibilities for access to web pages.

5.3 Learners with Access

The Age wise access for the total sample is shown in Fig 10.

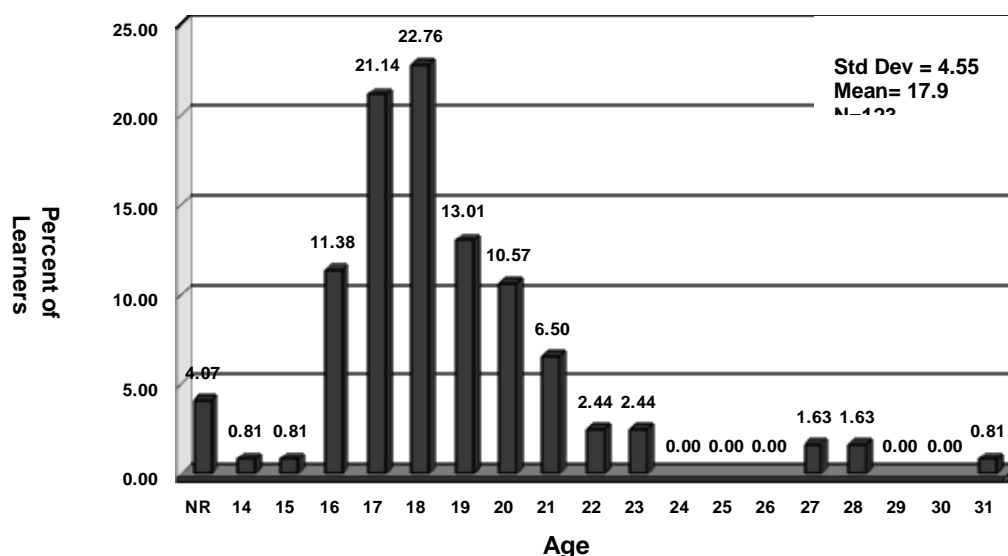


Fig 10: Age wise Access

It is seen that more females in the age range 14-19 years had access to mobile phones than the males in this age range as illustrated in Fig 11.

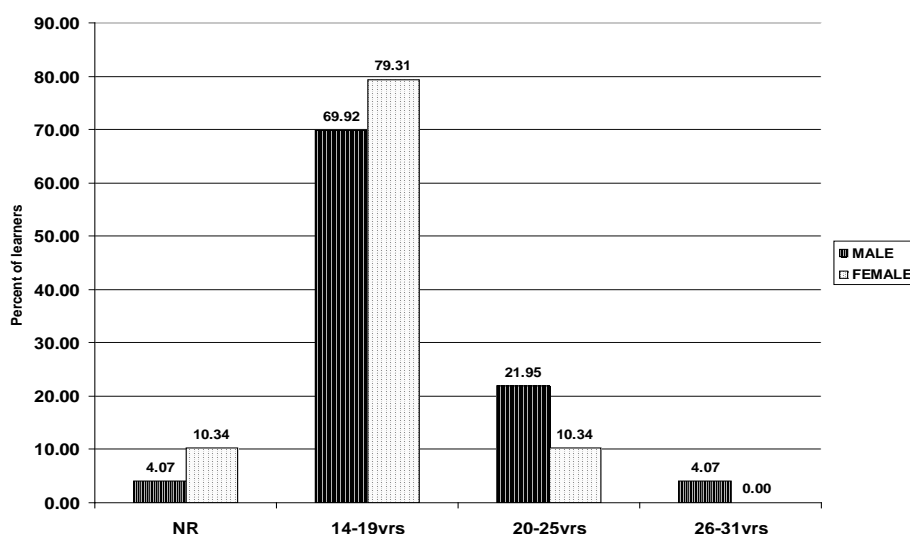


Fig 11: Gender-wise Access to Mobile Phones

Women surveyed across low and middle income countries on three continents believe that a mobile phone helps them lead a more secure, connected and productive life. Nine in ten women surveyed report feeling more connected with friends and family because they own a mobile phone (www.gsmworld.com/mwomen). This also came out here as illustrated in Fig 14 and Fig 15.

5.4 Year of Purchase and Handset preference

From 2007 onwards there is a rapid rise in the purchase of mobile phones by NIOS learners which is in accordance with the rapid growth of Tele-density in the country during this period. It is seen (Fig13) that 62% sample learners own Nokia handset and 12% own Samsung handset. In fact in mobile phone handsets, in Q3/2009, Nokia was the world's largest manufacturer of mobile phones, with a global device market share of 37.8%, followed by Samsung (21.0%), LG Electronics (11.0%), Sony Ericsson (4.9%) and Motorola (4.7%). These manufacturers accounted for over 80% of all mobile phones sold at that time. (http://en.wikipedia.org/wiki/Mobile_phone#cite_note-33). This is well reflected in learner's choice of handset as illustrated in Fig: 12.

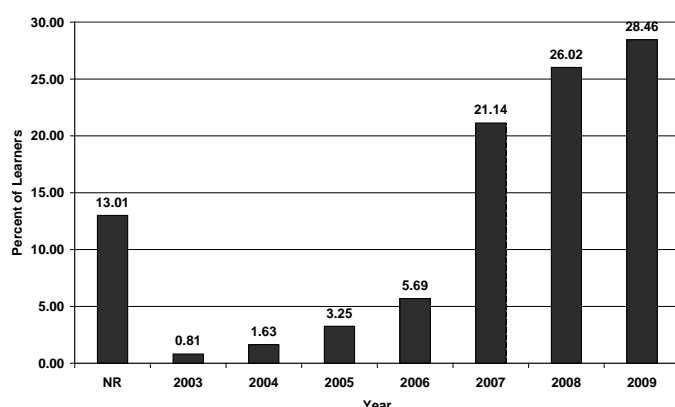


Fig 12: Year of Purchase

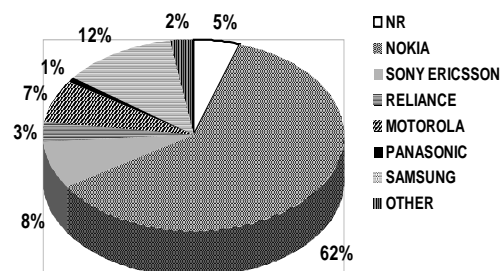


Fig 13: Handset Preference

5.5 Choice of Service Providers

It is very well known that customers select service providers or phone operators by its features like value added service, network coverage, tariff plans, attractive recharge options mobile technology (ie GSM or CDMA or both) and customer care.

According to the Telecom Regulatory Authority of India (TRAI), as on April 2010, the seven largest service providers in order of market share are Airtel (21.73%), Reliance Communications (17.49%), Vodafone Essar (17.26%), BSNL (11.75%), Tata Indicom (11.29%), Idea Cellular (10.86%) and Aircel (6.4%).

http://en.wikipedia.org/wiki/List_of_mobile_network_operators_of_India

This is very well reflected in this study where 38.21% of learners chose Airtel, 21.95% chose Vodafone followed by Reliance (12.20%), Idea (8.13%) and Tata Indicom (5.69%).

5.6 Motivation for owning a mobile (Fig 14)

In response to why did they take a mobile phone, 36.36% female learners responded to 'somebody (friends/parents) asked them to get one for themselves' and 39.39% responded to "Any other" mentioning that they could be contacted when outside the house, or it is useful in case of emergencies.

For male learners almost equal percent responded that they took a mobile because everybody around them had one, they wanted to buy one and they are easily contactable anywhere (for "Any Other").

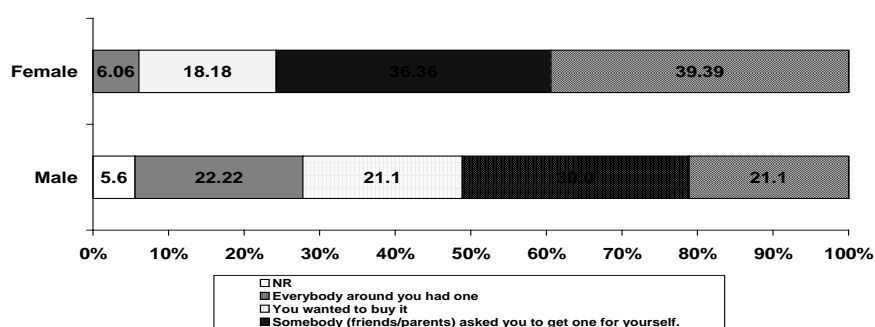


Fig 14: Why take a mobile phone

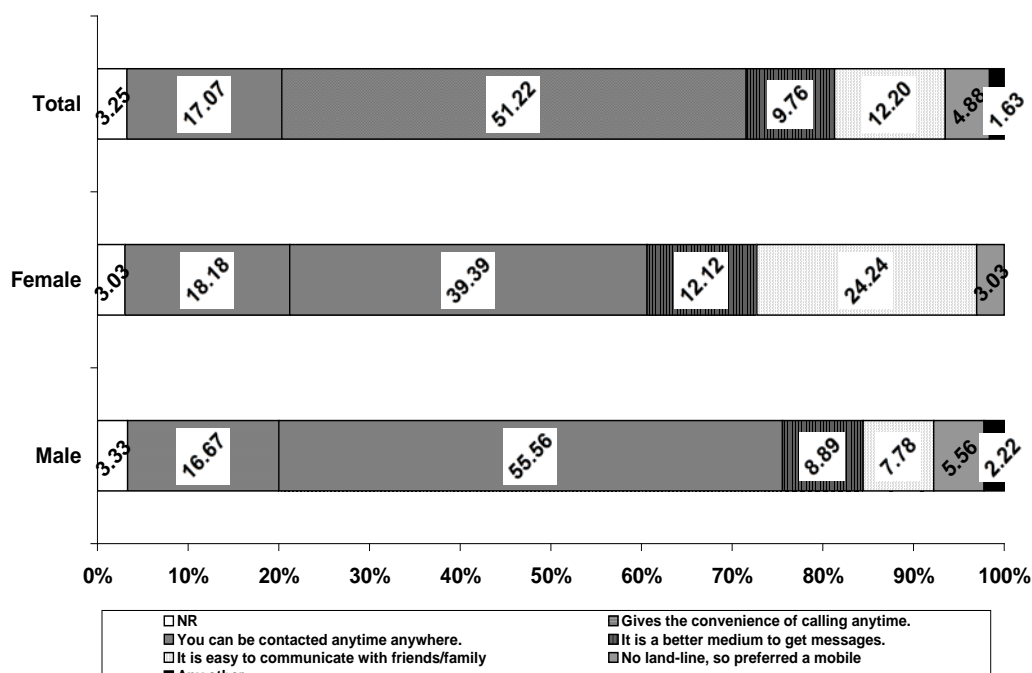


Fig 15: Reasons for owning a mobile phone

Looking into the reason for owning a mobile phone (Fig 15) it is seen that for more than half of the total sample learners "can be contacted anytime anywhere" is the primary reason for

owning a mobile. However, for 24.24% female learners, easy communication with family and friends seems to be the prime reason. As pointed out by Campbell (2002), research indicates that some trends in the adoption, perceptions, and uses of mobile communication technology can be linked to age and gender. He cited a number of studies to state that young people tend to regard the technology as fashion and use the mobile phone to demonstrate affiliation with peers while older adults have been found to emphasize mobile phone use for instrumental purposes and safety/security.

For 61.79% learners the mobile was purchased by their father or elder brother /sister. 30.89% purchased themselves. For the remaining the company/office in which they worked provided them with a mobile phone. It is evident that family members of the learners were keen to be in touch with them when they are somewhere else.

5.7 Calling and Billing pattern

78.86% learners keep their mobile phone on all time and 66.67% of them answer to all calls received. 68.29% sometimes keep their mobile on silent /vibrate mode while 17.07% always keep their mobile phone on silent/vibrate mode. Only 10.57% never keep it on silent/vibrate mode. Generally 50.41% call home when out of house while 37.40% call friends. Only 9.76% call for business /work purpose. 51.22 % responded to say that they can do without a mobile. The common place where learners use their mobile phone is at home (67%) as shown in Fig 16 below;

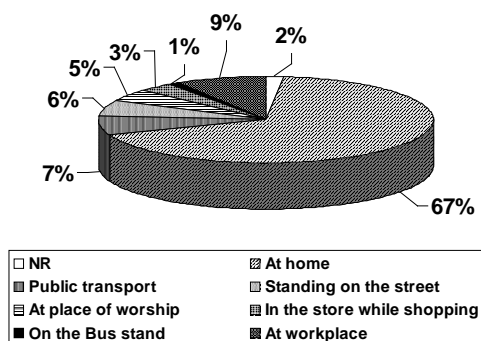


Fig 16: Common place of Use

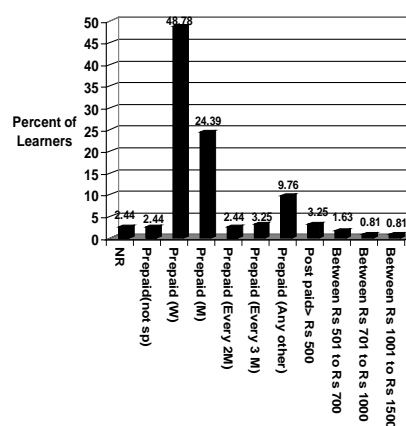


Fig 17: Billing Pattern

As illustrated in Fig 17, most learners (73.17%) were in prepaid billing mode and out of them 48.78% were in weekly prepaid mode. The preference for pay as you go seems to be popular. Probably they can control their expenditure in the use of the mobile phone.

5.8 Mobile Functionality (Fig 18)

Among all the functions of the mobile phone, 69.11% and 62.60% learners use their mobile phones always to make local calls and check time. The functions that many learners never use their mobile phones for are to check horoscopes (56.91 %), news updates (43.90 %), vote for TV competitions (43.09%), picture messages (40.65%), down loading ring tones (31.71%).

Although 76.42% use their mobile phone for text messaging, 38.21 use always 30.89 % use sometimes and 7.32% use often for messaging. A total of 63.41% use the function of taking photo out of which 34.96% use always, 13.01% use often and 15.45 % use sometimes.

5.9 Perceptions of General use (Fig 19)

Majority of the learners in the sample have access to and perceive the mobile phone as a technology that offers convenience and makes their life easier. There seems to be a change in perception in possessing a mobile phone from a 'status symbol' to a 'necessity' today. This is evident from the fact that 82.11% of the sample learners who possess mobile phones agreed totally or partially to the statement that 'mobile phones have become a necessity today' and only 1.63% of them strongly disagree to this.

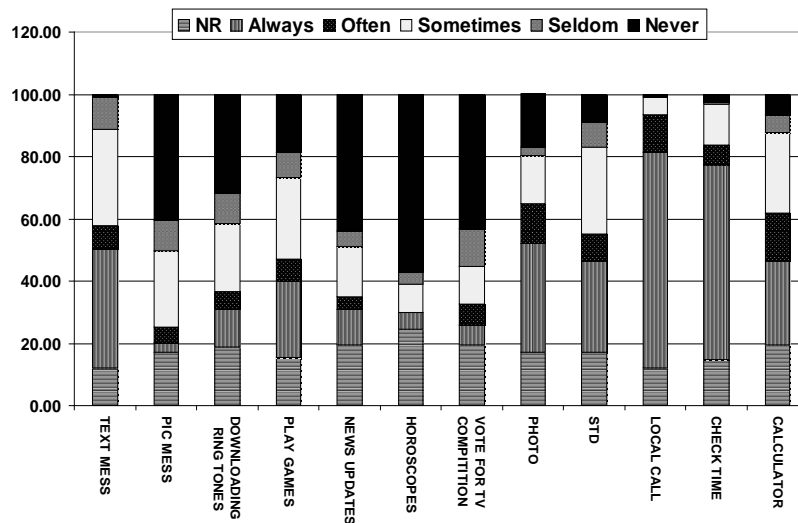


Fig 18: Use of Mobile phone functions by Learners with access

The mobile phones have introduced new stances, bodily movements in everyday behaviour of the users. It has affected the habits of the users. Research indicates that the harmful effects that can be pinpointed so far on use of mobile phones are behavioural ones than biological ones.

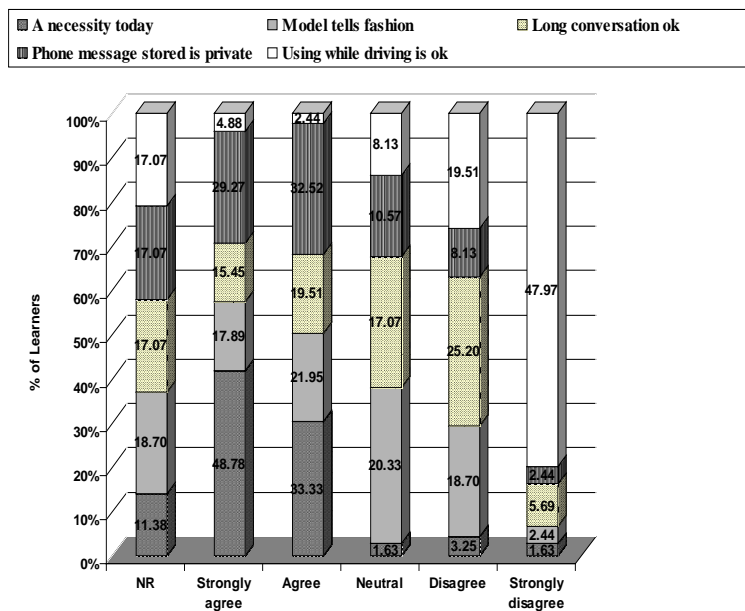


Fig: 19 Perception of general usages by learners with access

Considering this it was found (Fig 19) that 67.48% of the sample either strongly or partially disagrees to use mobile phone while driving. Agreement to the use of mobile phone while driving is ok for a small percent (7.32%). A total of 35.68% either did not respond or responded neutral to indicate that they do not have a perception about the implications of using mobile while driving. There was a mixed response to the statement 'The model you buy tells how fashionable you are'. While nearly 39.75% felt that their mobile phones are a style statement, 21.14% declined and 20.33% were neutral to the statement. Similarly, for 35.07%, long mobile conversations were strongly agreeable to agreeable and almost equal number of learners in the sample (33.09%) declined to the statement.

60.89% of the sample perceives the phone messages stored as private. A few (17.07%) did not respond while 10.67% were neutral. This perception of privacy could be attributed to a behavioural aspect of teenagers and young adults.

Cambell (2002) cited the findings of Katz, Aakhus, Kim, and Turner (2002) that history of ownership factored into certain perceptions of the technology. These studies show that mobile phone ownership, degree of use, and experience with the technology can influence perceptions and attitudes towards it.

The perception of frequent use of the functions of a mobile phone by the learners with no access to mobile phone yet is shown in Fig 20. It is apparent that since these learners never used a mobile phone, the response to the frequency of use of various functions was with apprehension and on an average 24.74% did not respond to this item as illustrated in the Fig 20. The functions that more than 50% of these learners perceive to use always to sometimes are text messaging (65.52%), downloading or forwarding ring tones (55.17%), play games (65.52%), take photos (68.97%), STD calls (65.52%), local calls (75.86%), check time (72.41%) and use as calculator (58.62%). The function that they perceive to use least is vote for TV competitions. Having not used a mobile phone these learners seem to have no idea about cost implications by the service operators for the use of some functions like downloading ringtones.

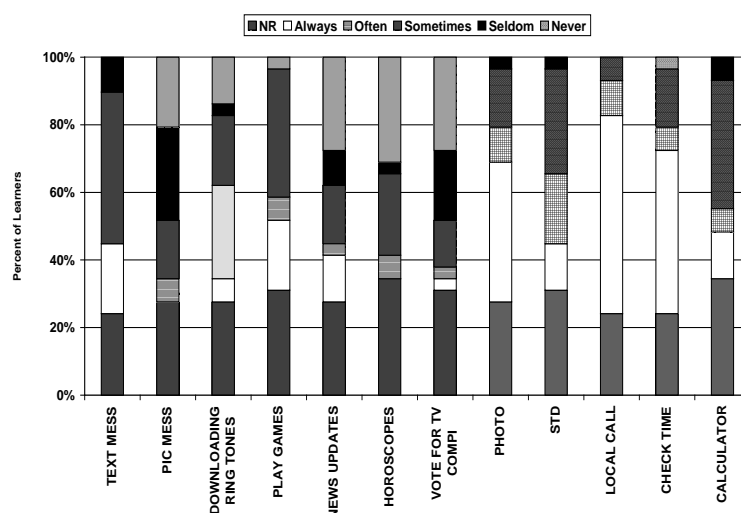


Fig 20: Perception of use of mobile phone functions by Learners with No Access

5.10 Perceptions on the Use of mobile phone for Learning

Different people perceive different things about the same situation. In trying to find out what the NIOS learners perceive on the use of mobile phones for learning, all learners in the sample were asked to respond to what would they use their mobile for in their learning situation. Table: 2 illustrate the response.

Table 2: Response of Learners to Use mobile phones for Educational Purpose

N=152

Purpose of Mobile Use	% of learners
Getting course information	49.24
Knowing the schedule of activities	21.05
Receiving SMS alerts to remind the dates for submissions of TMA's/registering for examination etc	32.24
Communicating and discussing with other fellow learners.	31.58
Receiving SMS for reminding about time and place for examinations.	30.92
Contacting a subject tutor for help/clearing doubts in a subject	30.26
Knowing about my results after the declaration of examination results	29.61

Getting course information seems to be important for most learners as opposed to other purposes. Learners feel that they could use their mobile to find out what they need to do in order to learn the course and be successful. This has implications on designing the course. Brown (2003) found in his study the value of bulk SMS messaging, which resulted in a saving 20 times greater than when the postal service was used to distribute information to learners. A survey in Norway also showed that students considered SMS as a proper tool for spreading information about lectures; schedule etc (Divitini, Hargalokken & Norevid, 2002). In this case only 32.24% responded to sms use for alerts to remind different dates indicating that simply making resources available does not necessarily imply that all students would be motivated to use them (Van Weert & Pilot 2003).

66.67% of the total sample learners were aware of modern mobile phones with the possibilities for access to web pages. Those who owned mobile phones, 53.66% of them were aware that their mobile phone had this function of accessing web page.

When the total sample was asked on the use of access to web pages on their mobile phone the response is as shown in Table 3. It is seen that more than half the learners do perceive to use their mobile phones to access web pages in their learning situation for receiving course pages, submitting assignments, receiving feedback and doing project work. However 48.8 % perceive not to use to access and read course literature. Probably they perceive that due to small screen more time would be required to read and hence the cost factor in this case would be more than other uses. This implies that the type of content best suited to using mobile phones to learning is a critical issue for consideration along with the criteria for developing effective mobile learning design.

Table 3: Perception of Accessing web pages in the Mobile phone

N=152

Use mobile internet for	NR	Yes	No
Accessing web page	4.61	51.32	44.08
Useful to receive course page	6.58	51.32	42.11
Useful to plan/submit assignments	6.58	58.55	34.87
Useful to access and read course literature	7.24	44.08	48.68
Useful to receive feedback	7.24	50.66	42.11
Doing project work	5.26	51.97	42.76

It appears that most students may not be aware of the cost implications and had not considered how much it would cost them to use their mobile phone to access the web. All mobile providers charge users for downloads and use of browser functionality on their phones. Providers offer a wide array of packages from fixed use charges to pay-as-you-go and many variants in between. The charges for connected time can be considerable, and may not be apparent to the NIOS learners until after the fact.

6.0 CONCLUSIONS

Ownership of a mobile phone is no longer a function of who you know, but rather conforms to the conventional forces of demand and supply. Waiting lists are down and voice calls in India are amongst the cheapest in the world. This is evident from the mobile penetration rate in India and from the fact that 80% of sample learners in NIOS owned a mobile phone. The motivation to own a mobile phone by NIOS learners was primarily to be connected and contactable anytime anywhere---an aspect ideal for distance learning. SMS seems to be the most popular use of mobile functionality not only by those with mobile phones but also by those without mobile phones who perceives high usability of this function. It is believed that with increasing mobile-phone penetration, the use of SMS in both formal and non-formal education can benefit learners at a fraction of the cost of other methods. Hence this function needs to be utilised to support learning processes in NIOS for which the underlying implication lies with respect to developing an effective mobile learning design.

The positive learner perception of the technology of mobile phone offers exciting new opportunities for NIOS to place learners in challenging active learning environments, making their own contributions, sharing ideas, exploring, investigating, experimenting, discussing, but they cannot be left unguided and unsupported. As Laurillard mentions (www.wlecentre.ac.uk), to get the best from the experience the complexity of the learning design must be rich enough to match those rich opportunities. Also there are challenges with hardware such as issues of compatibility

between the different types of technology as well as the different software formats and platforms. Other challenges faced are those relating to network connectivity and downtime. Hence for many, mobile learning is effective as one element of an overall programme of learning interventions in the context of a blend rather than the primary delivery channel for content. NIOS may consider this aspect. No doubt the quality of learning can be enhanced by the use of mobile phones as learners are easily contactable than they were before.

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